

# AMATEUR RADIO

MARCH 1964



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2-

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## OUR COVER

During the recent Ross Hull Con-  
test it was possible, due to the  
activity in VK8, to obtain W.A.S. on  
50 Mc., so it is appropriate to show  
a collection of all VK Call Area  
cards. The reader should also refer  
to the Correspondence column (see  
page 17) and page 14 for the W.I.A.  
(V.H.F.) W.A.S. Rules.

## FEDERAL COMMENT



As yet another Easter approaches, so does the annual meeting of the  
Federal Council of the Institute—the Federal Convention. This will be  
the 28th meeting of Federal Council at a Convention and could prove to  
be a momentous one in the long history of the W.I.A. One might ask why  
this one should be any more important than any other Convention at  
which matters of policy and the future operation of the Institute are  
discussed. The answer will undoubtedly lie in the presentation of the  
first draft of the new Federal Constitution.

This important aspect of the Institute administration was thoroughly  
discussed at the last Convention where guiding principles for its prepara-  
tion were laid down. The Institute in the past on a Federal plane has been  
bound together as a whole only by mutual agreement between the Divisions  
which are autonomous bodies and as such are not obligated to a Federal  
amalgamation by law. The principles referred will now enable the  
Divisions to be bound to a Federal company by law yet still retain their  
own autonomy within their State boundaries.

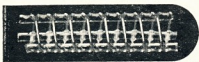
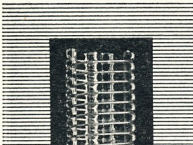
The average member is perhaps unaware of the necessity for the  
existence of a Federal governing body—space would prohibit giving every  
reason why this should be so; however, the main one would be a central  
authority through which the voice of the Institute would be heard and  
which would guide and execute the policies expressed by the different  
Divisions. There are other functions it would undertake such as the  
publication of the magazine, the task of which has been that of the  
Victorian Division for thirty odd years, the Call Book and other tasks  
which have placed a financial burden and onerous duty on one Division.  
In our Institute which has been steadily growing through the years, the  
establishment of a central governing body will enable a more rapid growth  
to take place which is all-important if Amateur Radio is to survive in  
Australia.

There will, of course, be many other important items to discuss at  
the Convention in Adelaide, which is the venue for the first time since  
1935. The success of this or any other Convention depends largely on  
the interest of the members of the host Division, and although Easter is  
a time when holidaying is prevalent, any members who can be present at  
the deliberations of the Federal Council are always welcome and can learn  
something useful about Federal administration of our Institute. We can  
promise an interesting experience for any visitors who can come along,  
and in addition we hope, a most profitable and momentous Convention  
from the aspect of decisions and policies.

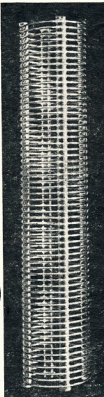
FEDERAL EXECUTIVE, W.I.A.

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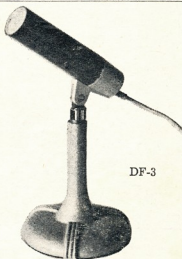
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# A LOW-COST U.H.F. GRID DIP OSCILLATOR

C. HAGOORT,\* VK5ZKC, and B. CLEWORTH,† VK5BQ

With the 70 Cm. band now available, some v.h.f. enthusiasts will want to construct equipment for this band. With this idea in mind, the writers have been experimenting with various circuits, tubes and layouts, and finally have decided on the following design.

No originality is claimed for the particular circuit used, however, it will be observed that the layout is novel and quite effective in practice.

Although it would be preferable to use tubes such as the 6CW4, which would result in a higher maximum frequency, we used the 6J6 because it is readily available and has a satisfactory maximum frequency capability (in this g.d.o., 550 Mc.).

sary will depend to an extent on the type of indicator used. A much older tube with no sensitivity control was used at VK5BQ.

The tuning capacitor used is a small single bearing type of about two plates at 5BQ, and three plates (10 pF) at 5ZKC. The shaft of this tuning capacitor is "hot" for r.f. and will therefore have to be insulated if hand capacity effects are to be eliminated. The material used is polystyrene.

Next comes the problem of the coil socket. If the overall frequency range of the instrument is to be as large as possible, then plug-in coils are indicated. Insulating materials which are satisfactory at the lower frequencies

ence to the layout drawing (Fig. 2) will show how this socket is arranged.

The coils themselves are made from  $\frac{1}{8}$ " outside diameter copper tubing, bent into the shape of a hairpin loop. Finally, after calibration, they are finished with a piece of P.V.C. tubing pushed over them. This precludes the possibility of shock to the operator. A neat job will result if the tubing chosen is a very tight fit and pre-soaked in a solution of amyl acetate or duco thinners to swell it. When pushed over the coils and allowed to dry it will shrink back to its original size. Differ-

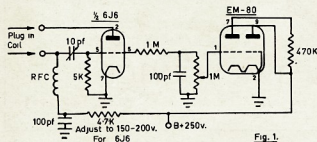


Fig. 1.

- |              |                         |
|--------------|-------------------------|
| C1—100 pF.   | R2—470K ohms.           |
| C2—10 pF.    | R3—470K ohms.           |
| C3—100 pF.   | R4—1 megohm linear pot. |
| R1—10K ohms. | R5—470K ohms.           |

Everyone knows that the 6J6 will oscillate up to 600 Mc. with suitable tuned circuits, but it is not so easy to make it oscillate over the wide frequency ranges necessary for a practical g.d.o. This is further aggravated by the fact that the maximum capacity of the tuning capacitor will have to be reasonably large in order to provide as large as possible a frequency range with each coil. With these problems in mind, the series tuned circuit (Fig. 1) was tried and found to give the desired result. The only serious disadvantage is that the grid current varies over fairly wide limits, from maximum to minimum settings of the tuning capacitor.

To minimise this, a "magic eye" tuning indicator was used in both grid dippers since it has the advantage that it will cater for wider variations in grid current than a meter, the pointer of which can only be of assistance whilst it is "on scale".

In addition, it may be found desirable to use a sensitivity control as in the 5ZKC instrument. This is used to reduce the negative bias on the EM80 when the low end of each coil range is approached. Whether this is neces-

are often very "lossy" at u.h.f. The problem has been overcome in the following manner.

Two short pieces of brass tubing  $\frac{1}{8}$ " inside diameter and about  $\frac{1}{2}$ " long are made into two little sockets by cutting four slots with a junior hacksaw as indicated in Fig. 3. One socket is soldered rigidly to the fixed plate of the tuning capacitor, and the other one directly to the plate pin of the 6J6. The plate pin is then braced to the centre terminal of the 7-pin socket with a "blob" of Araldite.

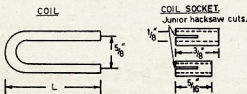
This method has the advantage that there is no additional dielectric loss over and above that in the valve socket and tuning capacitor insulation. Refer-

ent coloured tubing for each coil can be used to facilitate identification.

The coils can be calibrated with the aid of Lecher lines. With care an accuracy of approximately 1% can be obtained with this method. As the exact dimensions of the coils will depend to an extent on the tuning capacitor used, the dimensions given in Fig. 3 should be taken purely as a guide. With the exception of the top one, the coils should be made longer than necessary and small pieces trimmed off until the required overlap in frequency is obtained. 10 to 15 Mc.

will be ample. The total frequency range of the VK-5ZKC unit is from 285 to 555 Mc.

A scale can then be pasted to the outside of the case and calibrated from 0-100. Transfer this to the X axis of a graph, the Y axis of which is marked off in megacycles. Curves are then plotted for each coil in the usual manner.



- Length of coils (approx.)  
 A—2 $\frac{1}{8}$ " B—2 $\frac{1}{4}$ " C—1 $\frac{1}{2}$ "  
 C—1 $\frac{1}{2}$ " D—1"

Fig. 3.

\* Larkdale Ave., Sydenham, South Aus.

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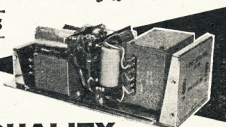
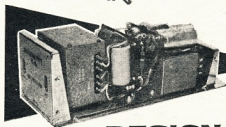
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# CONSIDERATIONS IN RECEIVER FRONT-END DESIGN\*

AL BROGDON, K3KMO/DJOHZ

The author explains the importance of r.f. selectivity and linearity, and methods of improving this important characteristic

THE Radio Amateur is faced with a communications problem which is unique in many ways. One of these unique features is that the Amateur is allocated continuous non-channelled frequency bands through which he may romp at will. This is found in no other communication service. This freedom to choose an operating frequency, plus the fact that there are more Amateurs in the United States than can be comfortably accommodated by the frequencies available for their use, results in mass mutual interference. This over-population of the Ham bands will certainly never lessen; on the contrary, it appears as if it must become progressively worse. The major factors contributing to this increasing problem are the phenomenal rate of growth of the U.S. Ham population, and the increasing pressure to reduce the Amateur's frequency allocations.

Thus, we may look forward to more and more interferences on the high frequency Ham bands. Practically the only approach to the solution of this interference problem is that of narrowing the bandpass of the communication receiver until it is just wide enough to accommodate the desired signal.

In the typical communication receiver the high selectivity is built into the lowest frequency i.f. stages. The selectivity curves as shown in equipment specifications are principally the selectivity of these low i.f. stages. These curves lead us to believe that this is the performance capability of the receiver, but the sad fact is that this selectivity cannot be linearly transferred back to the antenna terminals of the receiver.<sup>1</sup> The reason for this is that the tuned circuits of the receiver are linked by vacuum tubes (or transistors)—nonlinear elements. So the actual bandpass characteristics of the receiver will be degraded by the amount of nonlinearity in the transfer. Let's take an example to show the difference between the i.f. bandpass and the overall bandpass characteristics of a receiver.

On field day, there will often be two operating positions in close physical proximity but on widely-separated frequency bands. According to the manufacturer's (i.f.) selectivity curves, there should be almost an infinite amount of attenuation at such far-band frequencies. Yet the interference is present. Let us consider the reasons for the existence of this theoretically impossible interference.

The level of the undesired signal becomes so great that it causes the r.f. stage to draw grid current, causing any of a number of types of interference to occur. The sensitivity of the receiver

may be seriously degraded due to the extra bias placed on the over-driven stages through the excessive grid current. Cross-modulation may result because of the overdriven stage's non-linearity. Harmonics of the undesired signal are generated, which may cause a spurious response. Two strong signals may combine in an overdriven r.f. stage to produce intermodulation products. When one of these products falls at the receiver tuned frequency, it will cause interference.

With all of these possible sources of interference, it becomes obvious that the linearity and selectivity of the r.f. amplifier stages become very important in the reduction of interference from undesired signals. Although most Hams think of selectivity in terms of the i.f. selectivity, higher r.f. selectivity will pay off with better receiver performance in the presence of interference.

## A.V.C. AND BIASING

The use of proper biasing techniques in the r.f. amplifier stages is an absolute necessity. No r.f. stage should be operated without self-bias, and a.v.c. bias should be applied to all r.f. stages (plus the i.f. stages if desired). Two sophisticated systems that are recommended are the "delayed" a.v.c. and "hang" a.v.c. systems.

A delayed a.v.c. system is one in which the receiver is operated with the r.f. stages at maximum gain until a received signal reaches a predetermined level, after which the a.v.c. voltage is proportional to the signal strength. The hang a.v.c. circuit was developed for use with c.w. and s.s.b. reception, and features a fast attack time and a slow release time. This results in a.v.c. action which is applied at the first syllable (or c.w. character) with an unnoticeable delay, and holds in between words (or characters) to maintain a constant output during a transmission.

## R.F. RESPONSE

A spurious response can occur in a receiver when an undesired r.f. signal reaches the signal grid of the mixer. The selectivity of the r.f. amplifier determines the degree of rejection of the undesired signals. Therefore, the selectivity of the r.f. amplifier stages of a receiver must be considered over a wide frequency range. By injecting a signal at the antenna terminals of a 3 to 30 Mc. communication receiver, and measuring the voltage developed at the signal grid of the mixer stage it was possible to produce an r.f. selectivity curve. Thus it included the selectivity of all tuned circuits between these two points.

It was seen that the off-frequency attenuation rose to a maximum just above the tuned frequency, then gradually decreased and decayed into erratic valleys and peaks. The receiver under

test was tuned to 14 Mc. The attenuation in the vicinity of the two metre band was only 30 db. Thus it would be possible for a Ham using the tested receiver on twenty metres to experience interference from a nearby Ham operating in the two metre band! Sometimes interference crops up in unexpected places.

It is possible to minimise the erratic behaviour of the off-frequency selectivity of the r.f. stages, although it cannot be entirely eliminated. The performance may be improved by using minimum lead lengths, shielding between stages, filtering of all leads except signal leads, and the usual good design practices. In addition, the overall far-frequency attenuation may be improved through the use of external selectivity aids.

Most Hams nowadays use a common antenna system for both receiver and transmitter, with either a T-R switch or antenna change-over relay to connect the antenna feed-line to the transmitter and receiver. Also, most of these Hams use low-pass filters to minimise t.v.i. If the antenna change-over system is such that the filter is between the receiver and the antenna, when the switch or relay is in the receive position, it will provide an additional 30-80 db. of attenuation above its cut-off frequency. Also, some T-R switches themselves are frequency selective, giving the user an additional off-frequency attenuation of perhaps 10-30 db. Various bandpass filters have appeared in the Ham magazines specifically for use in multi-transmitter contest operation, and will provide additional attenuation of undesired signals. All of these may be used to increase the r.f. selectivity of a communication receiver.

## R.F. PREAMPLIFIERS

It would seem at first glance that the r.f. selectivity of a receiver could be greatly improved through the use of the commercially available preselectors. Actually, this title is not entirely accurate, since the units are primarily designed to act as preamplifiers, and may or may not have good selectivity characteristics. An example of this is the line of R.M.E. preselectors. The old DZ-22A was not only a good high-gain preamplifier, but provided outstanding preselection through its three gang-tuned circuits. However, the current R.M.E. preselector, the DB-23, has only one tuned circuit for each frequency band. The preamplification is excellent, but the preselection is very poor. At some points, the rejection of far-frequency interference may only be 18-20 db., which may lead to interference being generated within the DB-23 itself. Thus, the DB-23 would be a very useful addition to a receiver if

(Continued on Page 13)

\* Reprinted from "CQ", July 1963.

<sup>1</sup> Brogdon, A., "Two-Signal Selectivity Measurements," "CQ", August 1962, page 60.

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# INTRODUCTION TO CERAMIC DIELECTRICS\*

## PART TWO

H. F. RUCKERT,† VK2AOU

### CERAMIC DIELECTRICS An Engineering Problem

The case of Centralab, U.S.A., gives some idea of what is involved.

Centralab, a leading U.S. ceramic capacitor manufacturer, stated in 1948 that 30 ceramic and electronic scientists and engineers worked 150,000 hours preparing 25,000 HK compositions, but only two of these were used for mass production. Further, they stated that it will take them 15 more years to evaluate all measuring results and investigate special observations more closely.

This statement underlines the complexity of the job and the nearly infinite number of possible combinations. As one may well imagine, we could not do the development of ceramic dielectrics on such a grand scale in this country, but this example shows how much work is involved if one wants to reduce the chance of overlooking possibilities.

**Our Job:** In our profession, it usually goes like this:

A customer sends us a t.v. circuit and wants a suitable capacitor for a certain application, or he sends us some foreign capacitors and wants us to make exactly the same type. If we find something interesting in a technical magazine or in the patent literature, then a new developmental programme may be initiated, and the same is the case if we have a new idea ourselves.

In all the cases we have to translate electronic properties into chemical formulations, and these into ceramic processes (without a dictionary). Next, we have to prepare and measure ceramic capacitors, evaluate the results, and correct the formulation and change the ceramic processes to achieve the required properties more closely. This often means that electronic measuring techniques and new ceramic processes have to be developed. Production and measuring techniques have to be well understood, or the results will be misleading.

### SOME CERAMIC DIELECTRIC FORMULATIONS

#### LOW LOSS STEATITE

Typical insulator porcelain, at 1 Mc, has a P.F. 30 to 100 times higher than good mica or ceramic. The TC<sub>0</sub> is many 100 parts per million positive, and the I.R. falls rapidly at elevated temperatures. The alkalis were found to be mainly responsible for this, and it was also found that the same is so when glass compositions were tested. This means that we cannot use feldspar or clay with a high flux content, mainly sodium is dangerous.

The low loss steatite, composed of very pure talc (H<sub>2</sub>SiO<sub>4</sub>·Al<sub>2</sub>O<sub>3</sub>·SiO<sub>2</sub>) plus carbonates of earth alkalis (Mg, Ca, Ba) and other oxides as mineralisers, was the answer. Only small amounts of clay, contributing traces of flux, have to be added often to achieve vitrification below 1,400°C. The low P.F. of 0.04%, high I.R. of up to 10<sup>12</sup> Ω/cm. at 200°C., and the low K of 6 to 7 make this material very suitable as r.f. insulator, where low, stray capacities are required.

The TC<sub>0</sub> of P140 to 180 was more important in the past, because iron dust cores in coils of tuned circuits had a negative TC of the permeability and the resulting frequency drift could be compensated with steatite capacitors (German trade names, since 1932, are: Calit, Frequentia). L.L. steatite is widely used in switches, valve holders, terminals, v.h.f. coils, transmitter aerial insulators, etc.

#### LK DIELECTRICS

The electronic industry required dielectrics with higher K factors to be able to make less bulky capacitors. Suitable mica was not available in Germany around 1930-34, but they remembered a patent of Schmidt, 1902, in which he had found that TiO<sub>2</sub> had a K factor of 117. Then the Hescho and Stenag Companies developed, during the period from 1934 to 1938, a range of LK dielectrics with:—

K Factors of	14	40	80
TC <sub>0</sub>	NPO	N400	N750
P.F.	0.02%	0.2%	0.1%

and 1938/1939:—

K Factor	40	
TC <sub>0</sub>	N120	N250
P.F.	0.02%	

Nearly all the shapes and styles still used all over the world today were developed by these two firms about 25 years ago. The compositions used in those days were relatively simple:—

TC <sub>0</sub>	Mainly containing	Trade Name
NPO	MgO and TiO <sub>2</sub>	Tempa S
N120	La <sub>2</sub> O <sub>3</sub> and TiO <sub>2</sub>	Tempa T
N400	Clay and TiO <sub>2</sub>	Condensa N
N750	10% Clay & TiO <sub>2</sub>	Condensa C

These dielectrics had peculiar properties.

The NPO needed 1,450°C. to fire dense.

The N120 shrank about 50% (extruded tubes).

The P.F. increased 100 times at 800 c/s., 100°C., and the TC<sub>0</sub> became P7000 under the same conditions.

The N750 had a P.F. which was too high at A.F. before ZrO<sub>2</sub> was added.

The best bodies do no longer contain any clay.

Many compositions have changed since and they often contain up to 6 or 8 oxides, most of which have been pre-reacted in groups during a calcining process. One group allows for the adjustment of the TC<sub>0</sub> mainly, and another group influences the K factor.

Again, other additives improve the P.F. so that there is no deterioration under accelerated life test conditions (100°C., 100V/hou.), which could cause in some cases a partial reduction of TiO<sub>2</sub>, affecting P.F., I.R. and breakdown level.

The importance of temperature compensation was gradually appreciated more and more by radio designers, and this requirement had to be satisfied for all Armed Forces' equipment, and now too for domestic receivers. The introduction of ferrite coil cores for inductances of tuned circuits called for higher N TC<sub>0</sub> capacitors for the achievement of good compensation of frequency drift.

These are the reasons why we have all over the world now 17 standard TC<sub>0</sub> values of:—

P150	P100	P33	NPO
N33	N75	N150	N220
N330	N470	N560	N750
N1500	N2200	N3300	N4700
N5600			

It seems to be possible only to produce high P TC<sub>0</sub> values either with a low K factor or with a high P.F. The more common oxides of Zn, Sn, Zr, Mg, Ba, etc., are often used, which give suitable P.F. and K factors if just sufficient TiO<sub>2</sub> is added to achieve the desired TC<sub>0</sub>. The N750 body is still to 75-90% of TiO<sub>2</sub>, but much research work had to be carried out to overcome the P.F. increase occurring formerly after flash tests. The more negative TC<sub>0</sub> values can be obtained with alkaline earth titanates such as Ca and Sr, but other oxides have to be added to obtain the properties which are now world standard.

The highest K associated with low P.F. and the standard TC<sub>0</sub> is the target, but practical production requirements have to be considered as well. An LK series which would require a different firing temperature for each TC<sub>0</sub> type would be quite a costly nuisance for tunnel kiln operation; also, the TC<sub>0</sub> and P.F. should not depend too much on the firing temperature (±25°C.).

It is now possible to make NPO or N750 bodies with losses so small that discs 1" thick, with an oil-protected surface, have a P.F. so low that many well known Q meters do not register a P.F. at all. It is, therefore, not surprising that transmitter plate type capacitors using these dielectrics have almost entirely replaced the much larger and more expensive mica capacitors.

#### HK DIELECTRICS

It was around 1941/42 that the high K factor of Ba TiO<sub>3</sub> was discovered in U.S.A., Germany, Japan and Russia. However, most of the early work on HK bodies was carried out by Dr. E. Wainer, of the Titanium Alloy Manufacturing Co., and the many patents are proof of the tremendous work done and the important results achieved.

\* From a Lecture given to the Ceramic Society of Australia (N.S.W. Division).  
† 25 Berrille Road, Beverly Hills, N.S.W.

The K factor vs. temperature curves or TC<sub>K</sub> graphs are most important in comparing HK dielectrics.

The graph, Fig. 1 (curve I), shows the TC of the K factor of 99.8% pure Ba TiO<sub>3</sub>, and the curve II, gives an indication of the importance of having the correct stoichiometric ratio (+6% Ba O). The reduced K factor of curve III, shows one reason why clay is usually no longer found in capacitor dielectric formulations. Too much milling jar and pebble material have been ground off and contaminated the Ba TiO<sub>3</sub>.

In Fig. 2 we see the temperature v. K curve of Sr TiO<sub>3</sub> and Ca TiO<sub>3</sub>. The obvious aim was to shift the Curie Point of Ba TiO<sub>3</sub> from +120°C. and the K peak of Sr TiO<sub>3</sub> from -100°C.

impurities), and the price must be small compared with the labour cost of the product.

After satisfying the electronic requirements laid down by the customer or the world-wide standard of development, our ceramic production men call for modifications, so that the new mixture is easy to press or extrude, that the kiln furniture does not become contaminated, that the existing furnace does not cause heat-shock cracks, that warping does not occur, that firing in layers without a separating medium is possible, and that an already used production firing temperature below 1380°C. will give all the listed properties achieved in the laboratory. Quite often, we have to start all over again and again, trying to fit one more re-

quirement in a scheme developed so far, without losing other valuable features.

We, therefore, have a sample collection with capacitors from all tests in several thousands of numbered envelopes. All measuring data are being recorded in a library of lab. record books accumulated over 10 years. Quality control tests, with statistical evaluation of results and 2,000 h. accelerated life tests with climatic cycles, are carried out next, before a dielectric is approved for mass production of capacitors. If, finally, the customer does not like it, then the project has to go back to the ceramic lab. once more.

# PIEZOELECTRIC BODIES

Most bodies containing Ba TiO<sub>3</sub> become piezoelectric after polarisation. This is usually done by heating the capacitor up in oil above the Curie Point (130°C.), applying 100v./thou. and cooling the parts down gradually with the voltage applied. In recent years, PbO-ZrO<sub>2</sub>-TiO<sub>2</sub> bodies have gained importance, because their resonance frequency and piezoelectric coupling factor is far more stable with time and temperature. They often contain other oxides as well.

The firing of bodies, which contain PbO to over 50% dense, presents many problems. Lead vapour atmosphere of the right pressure, saggars and kiln furniture, which do not become fused by lead vapour, have to be used, to prevent too much shrinkage, porosity, distorted shapes and an unbalanced composition. Used in transmitters as radial mode overtone resonators, uniform structure and diameter are very

or so to the usual operating temperature of about 30 to 40°C. for radio and t.v. receivers, in order to raise the usable capacity.

By combining Ba TiO<sub>3</sub> and Sr TiO<sub>3</sub> in a ratio of 80:20 parts, we can achieve this first aim.

The next target was to broaden the peak, to reduce the TC<sub>K</sub> or to increase the K factor below and above the K maximum.

In spite of the tens of thousands of combinations made, the hundreds of patents claimed, and the trying of all metal oxides listed on the periodic table—including rare elements—it was not possible to achieve a K:5,000 or 10,000 NPO body.

Figs. 3 and 4 demonstrate how additions to Ba TiO<sub>3</sub> can modify the K vs. temperature curve.

Many titanates, stannates and zirconates are being produced in commercial quantities by T.A.M., to be available as additives to Ba TiO<sub>3</sub>.

It may be of interest to know that Ba can be replaced by Niobium, but the higher cost makes this material unattractive. When developing an HK dielectric, we can first try to obtain a certain maximum K, then an acceptable TC<sub>K</sub>, next a good break-down voltage of 8 kv. d.c. per 0.030" material thickness, a P.F. of 2% or less, and an I.R. of 10<sup>10</sup> MΩ per 3" diam. disc. The raw materials needed, to achieve these developmental steps one by one, must be readily available and of a sufficiently consistent quality (BaO/TiO<sub>2</sub> ratio, type of impurities, percentage of

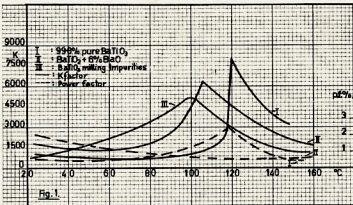


Fig. 1

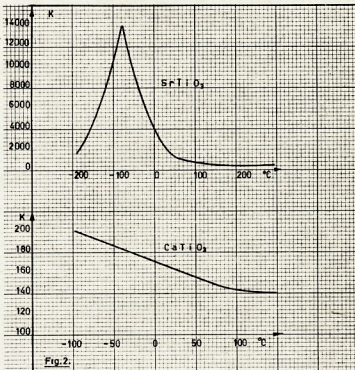


Fig. 2

important to obtain low insertion loss, selectivity and few spurious resonances. These dielectrics are now becoming very important as more applications are found.

### SEMICONDUCTOR CERAMICS

Semiconductor ceramics have been used in Germany since 1946 as heating elements in hot plates and cigarette lighters containing  $\text{TiO}_2$ , iron oxide, tin oxide and other ingredients. Uranium dioxide has long been used in thermistors by Siemens in a.c.-d.c. radios. Some ferrites and modern thermistor bodies also come into this class. Semiconducting bodies have also

for 3v. units, even this low voltage represents a very high field strength, and the capacity drops considerably with increased voltage. Even so, the I.R. reaches 1,000 to 10,000 M $\Omega$  and the breakdown voltage is usually 150 to 300v. for 30v. types. We were among the first few countries and firms in the world to market this type of capacitor. In the lab., we achieved, with a special process, up to 30  $\mu\text{F}$ . on a  $\frac{1}{2}$ " diam. disc, suitable for 3v., but this type is not yet on the market. That is 4,000,000 times the capacity a porcelain disc of the same size would have.

(iii) The barrier layer capacitor does not use a true ceramic dielectric any

rectifiers are formed. If we use indium or nickel as one electrode, to obtain an ohmic contact on this side of the ceramic and no diode, and silver on the other side, we will see that a d.c. current will pass 1,000 or more times better through this junction in one direction than in the other direction. An N type diode effect is being observed. (This is a simplified picture).

Usually, we have silver electrodes on both sides of the semiconducting ceramic, forming two similar diodes with opposing polarity, so d.c. current is greatly hindered in both directions by the reverse resistance of one diode for each polarity, and it looks, therefore, like a typical capacitor. The actual dielectric is formed by the reverse field causing an electron depleted area called double layer occurring at the interfaces of the semiconductor and suitable conductor due to their inherently different number of free electrons.

That is why the TCs, piezoelectricity and other dielectric properties of the ceramic, otherwise expected due to the HK type composition, cannot be found any more on these diode components which can be used as capacitors. The maximum working voltage, in combination with an acceptable I.R. or leakage current and P.F., is usually 12v. 1  $\mu\text{F}$ . capacity on a  $\frac{1}{2}$ " diam. disc for 3v. and an I.R. of 20 K $\Omega$  or 0.5 $\mu\text{F}$ . with 300 K $\Omega$  I.R. are possible.

One U.S. firm has produced this type of capacitor for over a year, and five more firms have marketed these capacitors in recent months. We have

been developed using transistor-like techniques. The following three types may be mentioned:—

(i) To increase the capacity per unit of component volume, as required by modern miniaturisation (transistor sets, space rockets), thin sheet HK pieces can be stacked by interposing alternatively conducting ceramic thin sheet pieces to act as electrodes (compare stacked mica and tin foil capacitors). The latter ones are composed of titanates and iron oxide. The stack is fired to form one block, which is not as fragile as individual silvered thin sheet pieces, 0.002" to 0.010" thick, made by various manufacturers.

(ii) The oxide skin type of dielectric is formed by adding a small percentage of rare earth titanate to an HK body. When this body is fired in oxidising atmosphere, a typical HK ceramic results, with an I.R. of  $10^6$  M $\Omega$  and a certain Curie Point and HK P.F., but, in reducing atmosphere, a material which is nearly black of very low I.R. is obtained. If now these pieces are reoxidised on the skin, by firing under suitable conditions, we can achieve an extremely thin oxide dielectric skin on a robust disc. In this way, effective apparent K factors of several millions are obtainable. In fact, we have two HK capacitors in series with a common ceramic semiconductor inner electrode. Highly sensitive piezoelectric transducers can be made in this way.

A ceramic diode results if one skin is damaged or broken down, because now the conductor electrode contacts the ceramic semiconductor. The TC<sub>0</sub> can be made quite low by adjusting the composition. Due to the thin dielectric, 0.0005" for 30v. types and far less

more. The ceramic is usually Ba TiO<sub>3</sub> with a critical Ba O to TiO<sub>2</sub> ratio doped with a small and critical amount of a rare earth or other oxide, which will affect the Ba TiO<sub>3</sub> crystal structure in such a way that the body becomes a semiconductor already when fired in air.

With commercial grade titanates, which have 2 to 3% impurities, and which may be out of balance by up to 4% as far as the stoichiometric ratio is concerned, firing under reducing conditions is still necessary to obtain the best properties, but reoxidisation is not attempted in this case.

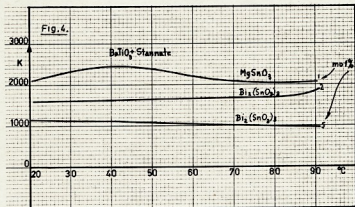
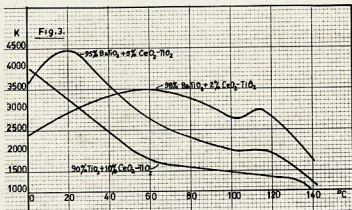
At the interface of the semiconductor (here a ceramic) and the conductor (here the silver electrodes), diodes or

developed similar units also. The TC<sub>0</sub> and voltage co-efficient of the capacity are low, but the leakage current is more in the order of the values measured on electrolytic capacitors. (We may even call the electrolytic capacitor a wet ceramic capacitor having an aluminium oxide body, and other combinations are possible, also.)

Some 200 millions of ceramic capacitors have been made in this country in recent years, doing their job in radios, t.v. sets, ships, aeroplanes, transmitters, fluorescent lights, and many other applications. ●

### ACKNOWLEDGMENT

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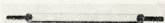
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# TRANSTRONIC PRODUCTS

123 BALGOWLAH ROAD, FAIRLIGHT, N.S.W.



# THE EDITOR REGRETS . . .

that certain actions taken by the Publications Committee have not been fully understood by some Amateurs, so this article is published to further explain the Editorial in the 1963 October issue of "A.R."

"Amateur Radio" magazine has a fixed income so that as further demands are made upon the Publications Committee to add additional features, it is necessary to adopt either one of two courses of action. If the magazine is made larger, costs will be increased and there is not enough money available to pay for the larger size issue. Therefore if additional items are to be added, space can only be made available by reducing that already taken up by existing features.

Over the past years articles devoted to S.W.L., Y.R.C. and S.B. have been added to the magazine, as your Committee believes that many readers are interested in these, and other subjects. But by publishing all such matters it has reduced the overall technical content of "A.R." and it is considered that most readers would prefer to have technical articles.

Accordingly it was decided to reduce the amount of space allocated to non-technical matters. It has never been said, nor has it ever been the intention of the Publications Committee not to publish any notes from the various sources.

Due to the Christmas holiday period, together with the close down for annual holidays, it was not possible to publish any notes or Hamads in the February issue of "A.R."

The above brief outline explains the broad principle behind the facts previously stated in the October "A.R." Editorial. The following paragraphs give a more detailed statement regarding specific matters about which some Amateurs are making incorrect statements. These are the facts.

## DIVISIONAL NOTES

Divisional Notes from all sources will still be published in "A.R." and all correspondents are asked to forward their notes each month. However, the amount of space that will be made available will be reduced, so correspondents should not be offended if some of their notes are omitted.

Never has it been the Committee's intention not to publish Divisional Notes. The October Editorial suggested that correspondents should publish purely local matters in their Divisional Bulletins, and forward items of general interest to "A.R." for inclusion in their Divisional Notes. Regrettably, some correspondents have not forwarded any notes and whilst it is not correct to name any one in particular, the Committee consider that many Amateurs miss the omission of the VK5 notes.

The facts are that "A.R." will publish Divisional Notes but less space will be made available. It is suggested that correspondents forward about one-third less notes, so reducing their space requirements. This will save time in editing.

Similar comments apply to the notes from the V.H.F., S.W.L., Y.R.C. and DX sources, etc.

Remember that "A.R." will still publish the various notes, but we cannot give each correspondent as much space as he would like. This can only be done when more money is made available to publish the magazine. Each page costs about £13 and at present we cannot afford to add more pages each issue.

## SIDEBAND COLUMN

The Sideband column has been temporarily discontinued until such time as a suitable sub-editor is obtained. When the facts became available to your Committee they were faced with the problem of producing three issues of "A.R." in the one month. Rather than add to their problems, they decided that the matter of publishing the Sideband column would be held over until early in 1964 when they could more fully consider it. Due to misunderstandings, statements are being made that "A.R." will not publish a Sideband column.

This is not a fact. Technical matters dealing with Sideband will again appear in "A.R." as soon as we can obtain the services of a suitable volunteer sub-editor.

## PREDICTION CHARTS

When the Ionospheric Prediction Service advised the Publications Committee that they could no longer provide the Prediction Charts in the form they had previously appeared, we had no option but to discontinue this service. No one on the Publications Committee is qualified to prepare suitable charts from the current information supplied

by I.P.S. To publish this information in graphical form, as is currently provided by the N.S.W. Divisional Bulletin, would cost "A.R." a very large sum of money. As already stated, we have not the funds available to do this job.

Until such time as we can afford to publish the charts in graphical form, or until some reader will volunteer to prepare such charts in another form, your Committee has no option but to temporarily discontinue this feature.

Suggestions from any reader on the matter would be welcomed and you may be assured that we will give every assistance to again provide this feature in "A.R."

## PUBLICATION DELAYS

"A.R." is run by an honorary voluntary committee who meet on the second Monday of each month. At this meeting all matters addressed to the Publication are considered and acknowledgment sent to the writers.

Technical articles have to be read and where necessary alterations made to the text and drawings have to be prepared in the majority of cases. Thus it is very rarely that a technical article can be published in the next issue of the Magazine. Generally three months at least will elapse from receipt of the article to its publication.

Some Amateurs overlook these details and become intolerant of the delays in seeing their article in print. They should realise that much work has to be done before their article is printed, particularly when detailed drawings are needed.

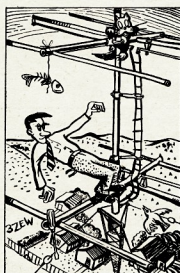
Your Committee does welcome readers' comments, not necessarily for publication, and if you are prepared to write you can assist to guide us in issuing a magazine you want. Remember, however, that we are limited by finances. We can only do what we believe to be correct. You must guide our thinking.

As Amateurs we possess two vital forms of communication, a magazine and our hobby, Amateur Radio. Yet problems still exist as the message does not always get across. Instead of passing unfavourable comments to your fellow Amateurs, why not advise the Publications Committee direct? In any organisation critics will always be found, yet it is always difficult to obtain volunteers to do any job.

Amateur Radio is our hobby, yet to cater for you, by preparing a magazine, requires some persons to devote much of their free time. Perhaps you may be prepared to also assist by some contribution to "A.R." Your committee can only prepare a magazine within their financial resources, hence many good ideas have to be rejected, not because we disagree with them, but because we cannot pay for them.

Any Amateur is welcome to attend any Publications Committee meeting or to serve on the committee. The door is always open, so please come in!

—K.M.C.



"The Amateur is Balanced"

# DX MONTHLY S W L

Sub-Editor: Bert Behenna, VK5BB.

Sub-Editor: Len Poynter, VK5ZGP.

NEW SOUTH WALES

Greetings fellow Amateurs! As your new DX sub-editor I find activity fairly low over the festive month of December. It will take some time to familiarise myself with this new chore.

I will make the plea to one and all, please send any news you may have on any piece of paper providing it has not been used previously.

Al VK4SS has been inactive except for a few contacts, but has worked the following: 3S ME—W8ADN, W8MGO, J4APF (1300z), 1 ME—UP2KA, V2RG, DU1L, Y091H, OK1HA, OK1BY, OK1KB, MP4BB, CN8FR, KP4BN, ON5ZQ, 5A1TW, HM1BW, GSQZ, CPPT, G8AB, MP4AS, U1CK, 45THN, V8-5HAA, VQ4IN/VSH, 5B4KN, 4X4DH, DUSRF, VU2PF.

20 mc c.w.: Ken VK5TL—AC5PN, CR8AD, CCF5V, ERF6G, IPIIE, H2ZAMS, MP4QB, SULIM, SV0WOD (Dodecanese), VP2KJ (Nevis), VQ8MD (Xmas), V86QZ, 9Q8AB (Conjolo). 30 mc s.s.f.: Ken VK5TL—ACTA, P3BAQ, VP2KJ (S.W. Islands), V8BAKH, YN1LH, ZB1A, Z4AF, 601KH, J4ACP, 9Q8AB, H8CFN. Peter VK5FM—KCB8K, DM2AND, MP4PQ, I2BL, ZC4CQ, MP4BQ, UA4FF, UA8AL, UD-6BW, W8850, W8BDEX (Ross Adey), 4X4KMP, IC2ZE, SP5GQ, LZ1DO, Y04AH, GM-2AR, GM2AR.

20 mc s.s.f.: Al VK4SS—JTICA, UA0KGF, UA0GH, OH1PN, SMSKV, VETE, UA0KDA, ZK1AR, KG6AA (mostly around 0700z).

## NEWS AND NOTES

Al VK4SS received VK/001 Certificate for 7 Mc. in 1962 OK Contest.

Anyone working 5 Mc?

BY1AD has been heard on 14 Mc. c.w. working stations outside Iron Curtain. Try 1000z.

V14S is first a.s.b. to have 300 confirmed.

V84H, V84M, V84IS—all active on 14 Mc. c.w. from Sarawak (1000z).

TU2AU active 14050 kc. Operator is WH6MI (1400z).

## QSLs RECEIVED

Ken VK3LT: YS1LA, 4U1SU (Egypt), FR-7ZC/T, 4U1SU, AC5A/AC5A, P2AB, HZ1AB, YV0AA, VP2AV (Antigua), 5B4CZ, VP5Y, 9G1DY, YS1M, VP5BY, ST2AR.

## SOME QUTS

HS1M—Braham, 7 Roda St., Cairo (U.A.R.).

VQ8QZ—Via GSPAG.

VQ2KJ—Via WAS5U.

SV0WOD—59 America St., Rodos, Dodecanese.

H8CFN—Via WA2WUV.

J4ACP—Via G3HPH.

9Q8AB—Via WH2ML.

CZ2L—Via WA2WUV, Box 3045, Jacksonville, Florida.

EI0RDS—Via I.R.T.S., 24 Wicklow St., Dublin 2, Eire.

KF8AU—Box 637, Noumes, New Caledonia.

K65BA—P. Hodges, Box 307, Pago Pago, American Samoa.

HS1L—Via WYB.

KX5AL—Via K4K74.

V84H—B. Shirlow, C/o. G.P.O., Kutching, Sarawak, Malaysia.

KV4CE—P.O. Box 1511, St. Thomas, Virgin Is. of U.S.A.

HS1B—Box 1038, Bangkok, Thailand.

SN1M—Z. Airport Commandant, Aviation Division, Kano Airport, Nigeria.

KX5AU—C/o. Box 46, Vientiane, Laos.

V84QV on Willis Is. is very active on 20 mc s.s.f., gives many a new country, seems to be very fair, and gives all a good go; nice to hear.

Would all accept wishes for '64. Please, would all who can give any assistance to this column do so. Thanks in anticipation. Thanks to Al VK4SS, Ken VK3LT and Peter VK5FM.

73, Bert, VK5BB.

No one can say that the v.h.f. enthusiasts did not make good use of their last months on 50 Mc. From mid November until mid January the 6 mc DX enthusiasts have had a field day. The activity during the Ross Hull Contest reached a peak around the 20th December and remained that way until the first week in January. All States were well represented, particularly VK. This was to prove the highlight of the season for many operators who were able to work their first VK8 and complete the tally for 50 Mc. W.A.S.

From early indications at least 50 will make the grade, including your scribe who completed the deed after a three-year wait. This is nothing when compared with Kolo VK6BO who has patiently waited 14 years. At the height of the season numerous Amateurs ideally situated made W.A.S. in a matter of a few hours and repeated the effort on a number of occasions. Call areas VK1-4-5-6-7-8-9 were worked from VK3 and it is a pity VK0 was not available to present someone with a W.A.V.K. Call Areas—50 Mc. This could be a distinct possibility within the next few years.

Two metres was not living up to expectations and only two openings occurred. On Dec. 24 VK2E and VK2ZCP worked ZL1AUM and ZL1ADE, and later in the month VK4-VK5 contacts were made, but nowhere near the opportunities as in previous years.

ZL openings were numerous on 6 mc right from mid November throughout the season, until early January. Activity from VK3 reports was quite low from ZL. The N.Z. t.v. Channel 1 made it easy to monitor openings in this direction. We are still rather mystified by the reception of the t.v. at 59 plus level and not a sign of a ZL. The ZL appears on a few openings but gather round reports only a few made contact.

A number of stations made the 1,000 mark during the contest. The general feeling that the period should still continue but submitting only a log for a seven-day period. It gives those not favourably located a chance to do good. However, it will be worth while seeing how the change in bands will affect those particularly in VK3.

432 Mc. opened solidly in most States on 1st Jan. First reports indicate quite good results. This column will be pleased to publish details of distances worked and records as they are made and broken. Who has worked the longest distance to date? Has restriction on using only 432-436 Mc. portion will cause some change of plans for the t.v. enthusiasts, but this will be overcome in time.

Well so much for this month. With the big lapse in time since the season I hope readers will excuse the departure from normal routine. I trust some party or parties will be interested in the letter from K16 (see Correspondence column) and will write for further information. Who will be the first lucky VK?

Don't forget those notes each month. Due to the new set-up, please confine your items to a resume of local activities. More detailed reports on 144, 432 and above would be in order. Time your letters to arrive by the end of the month. 73, VK5ZGP.

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If January is an indication of months to follow, the VK2 Group should be in a better condition than for some time, as during the month correspondence has increased, which shows a greater interest. I would like to thank the following s.w.f.s. for their letters: L2022, L2233, L2256, L2251, L2269, L2031. Norm L2251, an old Sydneyite, gone to VK4. Very pleasant to hear of your whereabouts. When you get that aerial up, let me know of your DX.

Don L2022 writes of QRM bother, also of intending to get a new tx. plus the erection of a better antenna. Hope you are successful in both ventures.

Ross L2233/VK4, in the Toowoomba area, has been on leave (Army Sig), but reports that he has received his N.F.D. award; congrats DM.

Sid L2255 reports having heard on 14 Mc. 11, YO, SV, KR8, KG6, GS, VSI, HB9, DL4, EA7, etc. The AMR300 must be really going well.

Chas. L2211 says that the v.h.f. season was the best for many a year. Best on 50 Mc. was VK8 in Darwin, plus a VK3 in Armidale and Inverell both around 300 miles.

Several s.w.f.s. took advantage of my offer of the booklet, "A Lot Depends on Your Aerial", and I trust they found the information very helpful. Copies are still available. Just send your request to me plus a stamp. If any member would like QSL cards printed at a very reasonable price, let me know, and it can be arranged.

Thought for the month: Learning only won't make a job safe. Safe application of technical know how will.

73, Chas. L2211.

## DX LADDER

	Cont.	Zns.	S.b.s.	W
E. Trebilcock	232	289	40	50
D. Grantley	113	272	38	20
A. Westcott	93	159	31	9
M. Hilliard	84	229	33	106
P. Drew	80	232	28	34
M. Cox	80	232	31	49
C. Abernethy	57	109	31	22
G. Earl	42	142	25	119
N. Harrison	44	119	29	4
I. Thomas	42	139	20	15

## TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R." in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.

Please address all articles to the  
EDITOR "A.R."  
P.O. BOX 36,  
EAST MELBOURNE, C2,  
VICTORIA.

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# W.I.A. (V.H.F.) W.A.S. RULES

W.I.A. 50 Mc. W.A.S. as at 6/2/64

Call	Cert. Add. No. Cntrs.	Call	Cert. Add. No. Cntrs.
VK4HD	27 8	VK3ZGM	40 2
VK4ZAZ	26 7	VK2ME	41 2
VK4ZBE	29 6	VK2ZCF	48 2
VK2WJ	13 4	VK2ASZ	50 2
VK3ZFM	22 4	VK6LC	1 1
VK3ZHF	25 4	VK6DW	3 1
VK3IM	30 4	VK2AEZ	10 1
VK9AU	32 4	VK3XA	11 1
VK4PU	35 4	VK3GM	12 1
VK2ABR	46 4	VK3ACL	14 1
VK4HR	4 3	VK3ZD	16 1
VK3PG	5 3	VK2HO	17 1
VK2ABC	8 3	VK3ZEA	18 1
VK2VW	9 3	VK7ZAQ	34 1
VK5GG	19 3	VK3ZBR	37 1
VK5ZAX	20 3	VK5KO	42 1
VK5ZBL	21 3	JA4IO	44 1
VK5BQ	23 3	VK4ZLC	49 1
VK7LZ	24 3	VK3ZGP	51 1
VK3QV	39 3	VK2WH	15
VK4RY	2 2	VK5AX	36
VK3ZGZ	28 2	JA1BYM	43
VK5ZZ	7 31	VK4ZAA	45
VK7ZAO	33 2	VK6ZAA	47
VK5ZMK	38 2	VK5ZSG	52

1. This award has been created in order to stimulate interest in the v.h.f. bands and is of a high standard to fully acclaim the proficiency of the recipients on their v.h.f. achievements. The award is to be known as the W.A.S. (Aust.) Certificate and is to be issued to any Amateur in Australia or overseas who satisfies the following conditions.

2. The Certificate will be awarded for contacts on the 50 Mc. band and higher frequency bands. All contacts must be made on the same band and cross-band contacts will not be allowed.

3. Portable operation will be permitted provided that such portable location shall be within the same State and not more than 25 miles from the fixed location in the case of Australian stations, and in the same call area and not more than 100 miles from the fixed location in the case of overseas stations.

4. The applicant is required to submit verifications from the following areas of the Commonwealth of Australia:—

- (a) New South Wales, Australian Capital Ter., or Lord Howe Is.
- (b) Victoria.
- (c) Queensland.
- (d) South Australia.
- (e) Western Australia.
- (f) Tasmania.
- (g) Northern Territory.

In all, seven (7) verifications are required.

5. Additional credit will be given for verifications from other overseas countries, say, New Zealand or the Territory of Papua and New Guinea, in the form of a sticker to be attached to the Certificate.

6. It will be necessary for the applicant to produce documentary proof in the form of QSL cards or other written evidence which completely verifies

a two-way contact has been made. By completely is meant that the time and date, signal strength, type of emission used, location of the claimed station and the frequency used must all be clearly shown on the verification.

7. Contacts may be made using any authorised type of emission and must be in accordance with the current P.M.G.'s Regulations or those applying in the country of the applicant.

8. Submitted verifications must be exactly as received and not altered or marked. Failure to comply with this rule will lead to the disallowance of that card and may lead to the disqualification of the applicant.

9. All applications must be accompanied by a list setting out the details required by Rule 6, and stating whether any of such contacts were made while portable, and if so, giving that location. Sufficient postage must be enclosed for the return of verifications to the applicant, registration being included if desired.

10. The verifications and list (Rule 9) will be addressed to the Awards Committee, Box 2611W, G.P.O., Melbourne, Australia."

11. The verifications so submitted will be examined by the Awards Committee, who will arrange for the successful applicants' names and call signs to be listed in "Amateur Radio". Certificates will be forwarded to successful applicants through Divisional Councils or direct to overseas applicants as the case may be.

12. The decisions of the Awards Committee of the W.I.A. in the interpretation and application of these rules shall be final.

13. Notwithstanding anything to the contrary, the Federal Council of the Wireless Institute of Australia reserve the right to alter these Rules from time to time as necessary.

## COLLINS RADIO COMPANY (A'SIA) PTY. LTD.

wishes to advise that, as from 15th February, 1964, their office is situated at—

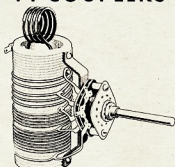
**5th Floor,  
Hooker House,  
327 Collins St., Melbourne**

the new telephone number is **61-2626** (3 lines)

telegraphic address "COLINRAD MELBOURNE"  
is unaltered.



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Price: £3/19/6 (inc. S.T.)

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To suit above Pi-Coupler. No resonances within Amateur bands if spaced diameter or more from metal panels. Stands 6 inches high on 1 inch diam. ceramic former. Base mounting bracket included.

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# NEW CALL SIGNS

AUGUST, 1963

VK2NR—Dr. D. W. Boyd, 80 Lurline St., Katoomba.  
 VK2AVO—R. O. Chapman, 21 Kallaroo Rd., Lane Cove.  
 VK2ZBN—J. Bracken, 12 Walker St., Lismore.  
 VK2ZTS—L. T. Scotney, Lot 8, Hilltop Ave., Paddisford Heights.  
 VK2ZTV—R. S. Gulton, 15 Pine St., Manly.  
 VK3EG—E. H. Gray, 218 North Rd., East Brighton.  
 VK3ER—G. S. Kiernan, Fishville, via Ballan.  
 VK3FN—R. E. W. May, 24 Nethercote Drive, Mt. Waverley.  
 VK3MO—L. J. Williams, 24 Lauriston St., Kyneton.  
 VK3PE—E. Sundstrup, 10 Valley Cres., Glenroy.  
 VK3PFV—P. J. Markman, 8 Purches Ave., Pascoe Vale South.  
 VK3SA—A. J. Sims, Gipps St., Yarram.  
 VK3ZAE—P. O'Shannessy, 19 Kilpatrick Ave., Shepparton.  
 VK3ZRL—W. R. Dickson, Lot 8, Coghill St., Broadmeads West.  
 VK3ZRO—R. W. Duckworth, 78 Ringwood St., Ringwood.  
 VK3ZSD—M. S. D. Flier, 13 Pascoe Rd., Ipswich.  
 VK4FY—B. A. Stevens, Station: Army Married Quarters, Greenbank; Postal: 401 Sig. Regt., Greenbank.  
 VK4JZ—R. J. Zimmit, 10 Cyprus St., North Ipswich.  
 VK4ZCM—S. B. McGregor, 39 Conley St., Clontarf.  
 VK4ZTW—W. A. Tomlinson, Hendry St., Tewantin.  
 VK5EO—E. H. Crail, 41 Minkie Ave., Mitchell Park.  
 VK5HO—J. R. Haskard, Oakbank.  
 VK5VF—T. Wireless Institute of Australia.  
 VK5ZJ—Station: Pine Lodge, Mt. Lotty; Postal: Box 1234K, G.P.O., Adelaide.  
 VK5ZDH—R. A. Jackson, 62 Shillabeer Ave., Croydon Park.  
 VK5ZJP—G. J. Perry, 131 Caulfield Ave., Clarence Gardens.  
 VK5ZRG—R. G. Graetz, 62 Paxton St., Williston.  
 VK5ZYX—G. B. Broad, "Pine Lodge," Summit Rd., Mt. Lotty.  
 VK6OK—J. F. O'Keefe, 38 Lenore Rd., Gooseberry Hill.  
 VK6ZAM—P. Morgan, Christian Bros. School, Highgate.  
 VK6ZAM—P. Morgan, Christian Bros. School, Highgate.  
 VK6ZAM—P. Morgan, Christian Bros. School, Highgate.

SEPTEMBER, 1963

VK1RD—R. Davis, 14 Hoves St., O'Connor, A.C.T.  
 VK1ZAC—A. M. Campbell, 60 Dept. of External Affairs, A.C.T.

VK2ATT—J. M. Pattison, Orana, 407 Marrickville St., Dulwich Hill.  
 VK2ATU—E. A. Parker, 10 Park Ave., Springwood.  
 VK2AVR—L. E. Thorne, 25 Harefield Close, Epping.  
 VK2ZGS—J. C. Bennett, 63 Princes Ave., Roseberry.  
 VK3ARQ—C. J. McAllie, 5 Renown St., Coburg.  
 VK3ZAS—R. A. Simmonds, 23 Yongala St., Balwyn, E.A.  
 VK3ZCE—J. A. Cullin, 18 Baden Powell Drive, Frankston.  
 VK3ZOU—J. C. Spence, Scotch College, Glenferrie Rd., Hawthorn.  
 VK4GW—G. S. L. Ward, 23 Ruth St., Corinda, Brisbane.  
 VK4US—Queensland University Squadron, C/o R.A.A.F. Centre, Alice St., Brisbane.  
 VK4WK—A. G. J. Ward, 37 Dale St., Maryborough.  
 VK4WN—J. C. Willis, R.A.A.F. Base, Amberley.  
 VK6FX—W. A. Fulton, Flat 4, 159 Labouchere Rd., Cemo.  
 VK6ZBD—R. S. Watkins, 48 Cobden St., Bayswater.  
 VK7ZTC—A. B. Carter, 22 Keane St., Launceston.  
 VK7BL—B. R. Barnes, Quiggins Rd., Wynyard.  
 VK7TB—A. E. Byrne, 30 Arthur St., Poatina.  
 VK7LT—L. M. Tonge, 3 Ashburner St., Devonport.  
 VK9BN—B. R. Newman (Rev.), Mendil, Southern Highlands, T.P.N.G.  
 VK9CA—M. McBride (Rev.), Mendil, Southern Highlands, T.P.N.G.  
 VK9GC—A. H. Sandilands, Bishop St., Rabaul.  
 VK9GL—G. J. Lunney, P.O. Box 1029, Boroko, P.T. Moreby.  
 VK9HG—H. J. Hicks, P.O. Box 251, Lae, T.P.N.G.  
 VK9MD—D. A. Morgan, C/o British Phosphate Commission, Christmas Is., Indian Ocean.  
 VK9XI—Christmas Island Amateur Radio Club, Christmas Island, Indian Ocean.

OCTOBER, 1963

VK2ANP—J. H. Collister, 116 Hillcrest Ave., Greencare.  
 VK2NA—Narrandera Radio Club, 50 Larmer St., Narrandera.  
 VK2AIC—R. H. Senler, Taylor Rd., Fern Bay.  
 VK2AIP—J. M. Burton, Glen Leigh Rd., Glen Innes.  
 VK2ALJ—A. J. Pearce, 7 Eltham St., Dulwich Hill.  
 VK2ALL—E. L. Lloyd, Station: vessel "Noelani"; Postal: 7 The Bulwark, Castlegong Station.  
 VK2AYN—R. W. Hubbard, 44 Memorial Ave., Blackwall.  
 VK2ZNN—J. Hawkins, 121 Fiddens Wharf Rd., Kilara.  
 VK2ZWJ—M. J. Wallace, Flat 8, 748 New South Head Rd., Rose Bay.

VK3VW—V. W. Stallan, 19 Vincent Cres., Werribee.  
 VK3ZAG—B. F. Swingle, 6 Norville St., East Bentleigh.  
 VK3ZWD—L. A. C. McCosker, 20 R.T.C. Radio S.C.L., R.A.A.F., Laverton.  
 VK3ZER—J. E. Kershaw, 3 Merlyn St., Footscray.  
 VK5CW—C. Hagoort, Larkdale Ave., Sydenham.  
 VK7NZ—Wireless Institute of Australia, Tasmanian Div., Northern Zone, 102 Charles St., Launceston.  
 VK7GK—L. K. Rieger, 98 Springfield Ave., Moonah West.  
 VK8ZMD—A. M. Dunn, 742 Dempsey Place, Rapid Creek, Darwin.

NOVEMBER, 1963

VK1AG—G. T. Allen, 7 Hedley St., Hackett, A.C.T.  
 VK1CX—B. H. Wall, 191 Duffy St., Ainslie, A.C.T.  
 VK2GR—G. E. Riley, 6 Barina Rd., Mortdale.  
 VK2MG—Bathurst Radio Club, Webbs Chambers, 171 George St., Bathurst.  
 VK2TO—T. O'Leary, 1/4 Bannerman St., Cremorne.  
 VK2AUJ—A. L. Robinson, 97 Hamilton Rd., Fairfield.  
 VK2AUV—B. J. Kirkwood, 3/8 Baden Rd., Neutral Bay.  
 VK2AUV—P. P. Crosthwaite, C.S.I.R.O. Radio Telescope, Parkes.  
 VK2AVZ—G. W. Vaughan, 126 Archer St., Roseville.  
 VK2AXC—Cessnock Amateur Radio Club, Cr. Allandale and Wollombi Rds., Cessnock.  
 VK2AZA—R. M. Marsden, Station: 11 Trafalgar Rd., Turross Heads; Postal: 43 Houston Rd., Kingsford.  
 VK2ZAJ—W. L. Riis, 1 Sears Ave., Raymond Terrace.  
 VK2ZIW—A. H. Wass, 1 Cannons Pde., Forestville.  
 VK3AAW—Warrnambool & District Y.M.C.A. Youth Radio Club, Cr. Lava & Henna Sts., Warrnambool.  
 VK4LL—L. F. Coyle, 18 Burrum St., Bundaberg.  
 VK4LV—E. C. Lavender, Flat 4, 28 Stopford St., Woolowood.  
 VK4SE—L. S. Stratford, Station: Marshall St., Goodwindi; Postal: P.O. Box 118, Goodwindi.  
 VK4ZRM—R. M. O'Malley, 13 Belair St., Annerley.  
 VK5NH—Nailsworth Boys' Technical High School, Rakes Rd., Nailsworth.  
 VK5ZCF—A. E. Cooling, 20 Blencowe St., Elizabeth Grove.  
 VK5ZKR—C. M. Hutchesson, Yahl, via Mt. Gambier.  
 VK5ZNT—W. N. Thomas, 15 Keevil St., Elizabeth North.  
 VK5ZRB—R. S. Bowman, Beau View, Parrakie.  
 VK5ZRR—R. R. Marks, 19 New Belair Rd., Torrens Park.  
 VK6GL—E. L. Gooding, Darkan.  
 VK6LX—L. J. Symonds, 48 Williams Rd., Kalamunda.  
 VK6ZBM—B. J. Byrnes, 4 Crowther St., Carharvon.  
 VK6ZBN—A. A. May, 11 Rene Rd., Nedlands.  
 VK6ZEA—L. Jessop, 17 Victoria St., Sth. Perth.  
 VK8HI—L. G. Reynolds, Station: O.T.C. Radio Station, Darwin; Postal: P.O. Box 288, Darwin.

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# Correspondence

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## AUSTRALIAN D.X.C.C.

Editor "A.R.", Dear Sir,

Now that the elusive 300 mark has been reached in all the three sections of the above, I would firstly like to congratulate all the members who have obtained that very creditable tally.

I would also like to pay tribute to our Australian DXCC list, which is doing such a mighty job and we should be thankful to him for the up-to-date lists of D.X.C.C. countries published from time to time. Thanks also to "A.R." for publishing these lists—something that is not even printed in the big noise overseas magazines.

After studying the latest list in "A.R." (Jan. 1964) some rather startling facts are noted. We now appear to have a total of 339 countries published in the list to date. Another has since been created by the A.R.R.L. but not yet on our list, so today there is 340.

Now off this number we must take two, the I.R.W. and C.I.W. and we are left with 338, you were lucky enough to be licensed prior to 1/4/49 when VO was deleted it is possible for a total of 338 to your credit.

Since 1/4/49 these 338, the total of 27 countries—C9, CR3, ET2, F7E, F1B, FN, FQ8, H1, J3Z, PK1-2-3, PK4, PK5, PK6, UAO, UAL, VO, VP2, VQ8, VSI, Z14, Z15, Z16, Z17, Z18, Z19, Z20, Z21, Z22, Z23, Z24, Z25, Z26, Z27, Z28, Z29, Z30, Z31, Z32, Z33, Z34, Z35, Z36, Z37, Z38, Z39, Z40, Z41, Z42, Z43, Z44, Z45, Z46, Z47, Z48, Z49, Z50, Z51, Z52, Z53, Z54, Z55, Z56, Z57, Z58, Z59, Z60, Z61, Z62, Z63, Z64, Z65, Z66, Z67, Z68, Z69, Z70, Z71, Z72, Z73, Z74, Z75, Z76, Z77, Z78, Z79, Z80, Z81, Z82, Z83, Z84, Z85, Z86, Z87, Z88, Z89, Z90, Z91, Z92, Z93, Z94, Z95, Z96, Z97, Z98, Z99, Z100, Z101, Z102, Z103, Z104, Z105, Z106, Z107, Z108, Z109, Z110, Z111, Z112, Z113, Z114, Z115, Z116, Z117, Z118, Z119, Z120, Z121, Z122, Z123, Z124, Z125, Z126, Z127, Z128, Z129, Z130, Z131, Z132, Z133, Z134, Z135, Z136, Z137, Z138, Z139, Z140, Z141, Z142, Z143, Z144, Z145, Z146, Z147, Z148, Z149, Z150, Z151, Z152, Z153, Z154, Z155, Z156, Z157, Z158, Z159, Z160, Z161, Z162, Z163, Z164, Z165, Z166, Z167, Z168, Z169, Z170, 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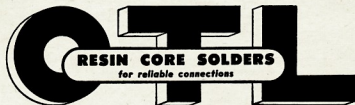
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# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### FEDERAL CONSTITUTION ALTERATION

Federal Executive, on behalf of the Federal Council of the Wireless Institute of Australia, hereby gives notice that it is intended to alter the Federal Constitution of the Wireless Institute of Australia 1947 as follows:-

#### (a) Delete Clause 21 and substitute:-

"21. The Headquarters Division shall call for nominations annually from all its members for appointment to the Federal Executive, such nominations to be received not less than 60 days prior to the conclusion of the fiscal year. The nominations which shall include the names of any retiring members of Federal Executive willing to re-nominate shall be submitted by the Headquarters Division to the Federal Council for the appointment by preferential vote of seven members, two at least of whom shall be retiring members."

#### (b) Insert new Clause 21a:-

"21a. The new Federal Executive shall take office at the conclusion of the Federal Convention which they shall attend, or where a Federal Convention is not held, within one month of the conclusion of the fiscal year. The Federal Executive shall determine its own offices in such manner as considered necessary."

#### (c) Delete Clause 24 and substitute:-

"24. The appointment of Federal Executive which shall be finalised by the Headquarters Division not less than 14 days prior to the conclusion of the fiscal year shall be notified in writing to Federal Council prior to the conclusion of the fiscal year. The Federal Executive shall notify Federal Council in writing of the offices and appointees thereto within 30 days of the commencement of the new fiscal year or the Federal Convention whichever is the sooner."

Any member of the Institute not in agreement with the proposed alterations should notify his objections to the Federal Secretary within 14 days of the publication of this proposal.

### CALL BOOK MAGAZINE

The Federal Treasurer, W.I.A., has for sale at £1 post paid some recent back numbers of this directory of Amateurs. Only the American edition of the magazine is available at the moment. Apply Bob Boase, VK3NI, 30 Cardigan St., Carlton, Vic.

## FEDERAL QSL BUREAU

In these notes in the January issue it was stated that Graham VK2JAH was handling QSLs for VK4JQ, VK4JL and VK4JN. This is NOT correct. The QSL manager for VK4JQ is WERYH. Graham, however, is handling QSLs for VK4HG and VK4WV, ex Willis Island.

The box number of the Hungarian QSL Bureau has been changed. The new address is: Central Club of Hungarian Radio Amateurs, P.O. Box 10, Budapest 3, Hungary.

Copies of "CQ" for 1963 are available from this Bureau for free. First applicant gets them for postage. Do not send postage with application. Successful applicant will be advised of postage required.

## NEW VIDECONS

FOR APPROX. £20

4.5 Mc. minimum response, no smear. Offer open for one month only. Write for details.

VK5ZDZ, 74 Fisher Street, Fullerton, South Aus.

Any station needing American Samoa on c.w. should look for KTVAX/KS6 around 0530z on 14065 kc. Bill, who is a teacher in Pago Pago, is on duty there for at least two years. He has a good signal, but his operating speed is limited to 10 w.p.m. Full QTH is Box 458, Pago Pago.

After almost a month of light mail, incoming cards thickened up considerably over the Xmas week, to bring the December total to over 5,000 cards.

Was pleased to see Bruno Bossert, HB9QO (QSL notes Jan. "A.R."), in Melbourne during Xmas and New Year. Bruno will return to Sydney for a few weeks before settling in Melbourne for the remainder of 1964. Another Swiss Ham, Fred Beusch, ex HB9AB, ex VK8HB, presently in Sydney, expects to visit Melbourne early in 1964. His movements thereafter are still uncertain.

Frank Hine, VK3QL, QSL manager for VK2 Division, is anxious to obtain the present address of VK2FR who was on Lord Howe Island for some time. He has apparently left L.H. and no forwarding address is known. Inform Frank, care Box 1734, G.P.O., Sydney.

The Federal Bureau is in receipt of a bundle of cards from the Austrian Bureau, addressed to OE1 and OE2. It is Karl Krieger, and he is apparently now in VK. Any info as to his present QTH to the Federal QSL Manager please.

—Ray Jones, VK3RJ, Manager.

## NEW SOUTH WALES

### HUNTER BRANCH

During the holiday period, activity on the v.h.f. bands has shown an increase and there has been some worthwhile DX, especially on 6 mx. Those responsible for much of this activity are K2ZKW, Mac YZ2W and Stuart 2AYF. In addition, a real first was scored by Des 2ZDN when he worked Sydney on 432 Mc. The other two were working which have been available on this band. Des must be congratulated for his pioneering work. Not all contacts have been conducted on v.h.f., however, many have been made on HF. Re-building and testing the gear, Harold 2AHA has finally managed to get "Big Bertha" on the air, running several watts of sideband to an 813. Reports are that this is a potent signal and Harold is pleased with the lack of t.v.i. Frank 2FC has had some success with the series site modulation, but he claims that it is still capable of improvement. He is looking for some information on the system from someone who has used it successfully.

Otto 2SI is still battling with his Rothman system which was found to be unsatisfactory with a pi coupler. There were also some modulation troubles at 2AWX, but these have been resolved and the signal now sounds a little better. Now a man of considerable leisure, Jack 2KQ is thinking about being a regular on the air. He has heard that the new 50 customer 58. Bill 2ZL still watches the one-eyed monster in preference to listening to the monster right in front of him. The other boys have all the answers to the quiz questions, he'll come back to the fold. Bill 2XT is not sure whether to put s.s.b. or a.m. in the new car since the amount of time he has to spend in the previous vehicle and time between refits and conventions is all too short. Chris 2PZ is some one's hero in the German market but no Amateur gear as yet.

It was pleasing to see that second and third prizes for the two mx hunt at the State Convention were won by Les 2UT and Bill 2XT. This proves their ability as jigsaw puzzlers is above average. According to all reports Lionel 2CS is never at home these days and he was heard to remark that he was glad that since he has retired he's been wondering how he ever made enough time to go to work! Don't forget the next meeting of the Branch is the Annual General Meeting and the election of Officers for 1964. This will be held in Room 15, Classroom Block, Newcastle Technical College on Friday, 6th March, at 7 p.m. As well as the elections, some other entertainments will be arranged, so come along and bring some hecklers with you. Don't let them have it all their own way. See you there, 73, 2AXX.

## CANBERRA RADIO SOCIETY'S EASTER CONVENTION

The committee of the above Society has decided to organise an Amateur Radio Convention at Canberra in the Easter week-end. The programme is as follows, the times shown being subject to minor changes.

Friday, 7th March: Midday to 6 p.m.—Mobile Contest, subject logs for any two-hour period with the last QSO logged, being made inside VK1. 7-11 p.m.—Gathering at the Society's Club Room (VK1ACA). Tea and coffee, etc., will be available and possibly films of interest will be shown.

Saturday, 8th March: 11 a.m.—12.0 p.m.—Picnic lunch at Cotter Dam Reserve. 12.30-1.30 p.m.—Rx sensitivity contest (details see below). 2.30 p.m.—Hidden Tx Hunt at Cotter and disperse (th. 4 p.m. and h.f. Fox Hunt (inside Canberra). 8 p.m.—Dinner at the "Ren of Canberra".

Sunday, 9th March: 10 a.m.—Visit to A.N.U. Nuclear Physics. 3 p.m.—All-band Scramble 3-6 p.m.—V.h.f. and/or H.f. Fox Hunt, followed by Hidden Tx Hunt. 8 p.m.—Visit to Mt. Strevell Observatory.

Monday, 10th March: 10 a.m.—Visit to Belconnen, the Naval Radio Base, housing the most powerful tx in VK land. Details: Logs from Friday Contest are to be given in by 7 p.m. at the Club Rooms at Riverside, Kingston.

Competitive contests: You will be at the Cotter Reserve in the gully where receiving conditions are bad. A tx will have its power gradually reduced as phone code messages will be sent at specified intervals. Any antenna is allowed.

Accommodation: It is rather late but we have that by this time most of the accommodation will have been fixed up through George VK1GB. Send a deposit of £4, stating what accommodation is desired to VK1GB, Dickson, A.C.T.

To find the Club Rooms, proceed east from the front of Parliament House, across a dual carriage way (marked for the new bridge) and W.I.A. signs will direct you from there.

## VICTORIA WESTERN ZONE

We heartily welcome two new call signs to the Zone, Brenda 3KT and Harry 3ZX, who qualified for the full ticket. Brenda is John 3AFU's XYL from Clear Lake and Harry is from Horsham. Mac 3AZM (Horsham) had the misfortune to lose his Bendix frequency meter in a recent fire. Bill 3AKW (Lubeck) is at last connected to the S.E.C. mains. Rodney 3CU, now 3UG, is permanently reconnected to the mains. The new station QTH in Melbourne—works at the same QTH as Gordon 3OW, ex Rainbow, and about fifteen other Hams, including Ron 3OM. Neil 3AGD (Hawthorn) has completed his new station and is radiating an excellent signal therefrom on 80 mc, running about 60w, to parallel 807s.

3ADS (Glenorchy) has replaced the ground plane with a dipole with satisfying results. Both David and John 3AFU are busy boys these days with C.F.A. networks, but still find time to complete his new Zone hook-up. Merv 3AFO (Horsham) has been brass-pounding of late in an effort to get Alex, a Ford 16, up to Amateur standing and aged only 16, Alex has already passed all their papers, so we are tipping another Ham will be in the Zone before long. Vic 3AKJ (Horsham) steamed his 80w up to 80 mc on 80 mc other night. The first QSO for about seven

## W.I.A. QUEENSLAND DIVISION

### A.O.C.P. CLASS

commences

THURSDAY, 12th March

Enquiries to Hon. Sec., Box 638J, G.P.O., Brisbane, or Class Manager (VK4SA) Phone 56-3488.

years. Welcome back, Vic. Another Vic, 3AEQ (Murtov) is busily engaged in re-wiring a heavy duty power supply, but due to pressure of business these days finds it hard to keep at it. 73, 3AFO.

## QUEENSLAND

### WIDE BAY & BURNETT RIVER

Jimmy 4HZ has been on holidays again—how that young fellow gets around! Lee Downing persevered with the mouse key and the P.M.G. rewarded him with a call sign of 4HJ and Dudley Lynch was successful at his theory examination. Here's my hand boys. Harry 4ZHG shut up shop for the festive season and himself off to the Gold Coast, hob-nobbing with the V.I.P.s and the mermaids, although he won't have much chance to date them as his XYL (Audrey) and four harmonies went with him. Since he has been back home, the spiders are spinning webs in the rig as he is busy building a boat. Perhaps he is still thinking of those mermaids.

The Youth Club has re-commenced again after the holidays, but associate John Lind, Harry's instruction partner, and the electrical distribution in this centre, has been transferred to Brisbane (maybe to sit in the manager's chair) so that leaves Harry doing the instruction on his own. So he has the junior boys one week and the seniors the other. It helps to keep him out of mischief and his mind off the mermaids.

Bill Tomlinson, of Tewantin, who is now 4TW, is too busy with his call sign. He is at the toppling over people's squabs and monsters perking. He should slow up a bit longer. They say only the good die young, so he should be right for a few years yet. 73, Fred Cox.

### TOWNSHIP AND DISTRICT

With the advent of the Ross Hull Contest, must be that the boys in the township are having a field day almost every other day. The QSO numbers being exchanged by a lot of them are really fantastic, when one looks back to the past contests. Sorry to report that these fantastic openings are not for the north. Personally I have only managed 28 QSOs for approx. 80 hours operating. At long last managed to work a VK6, so have only to hear and work a VK6 and then I can worry AH 3KB to send along the necessary award. All will have to wait overtime getting the awards out as some say that here W.A.S. every few days. Congrats to some of the newcomers that have earned their first QSO. I have been trying for five, or is it seven, years.

The other bands are not yet open wide, maybe due to the extra high noise level. Only four local stations have heard me. Must try. Wonder what has happened to them? Charlie 4BQ and family up on the Tablelands for the holidays, while Owen 4OV and his family are all the way in from Mt. Isa to spend the vacation on Magnetic Island. Ere this is read, I will be on my annual pilgrimage to Melbourne to catch the boat home. Must try and miss the onset of the wet season, maybe a cyclone if predictions are correct. 73, 4RW.

## TASMANIA

Remember to vote at the forthcoming Council elections. We hope to see you at the Tasmanian Council to be held at Launceston on Saturday 21st March, 1964. The Northern Zone is arranging matters this year and we confidently expect a very wonderful event, so do not miss it.

December and January have been months for mobile and portable work, despite the very heavy rain. The DX list has been very good and have been Ken 7KH, Jack 7JB, Terry 7CT, John 7JP, Harold 7MZ, Len 7KC, Snowy 7CH (mobile 7MZ), Denis 7DK and 7ZMH. We have also had some DX and visitors who were pleased to meet Guy and Alain who operated FB8YY at Adelle Land, and I personally rejoiced at the opportunity to speak French with

them and thank them for their patience. The other DX visitor was Chris KB02, a s.b. friend on 20 mhz, aboard the U.S.S. Glacier, which called at Hobart early in February. Charles gave us a delightful and much appreciated impromptu address at the February general meeting of the Division.

Lee 7KC has successfully got operating a one-watt 100 mhz rig and is doing good too. Finally, a personal comment. Thanks to Michael 7ZAV, who wrote the monthly notes while I have been out of action, for my injured hand. The fact that I contribute these notes indicates that I am well on the way to a full recovery after the lapse of six months. I thank all those who so kindly helped me, whether by visits or by QSO, during my enforced idleness. I especially thank Ken 7KA who loaned me a good many books, and the hospital, and David 7ZAV and Ted 7EB who visited me regularly. Thank you chaps, one and all. With very 73, 7ZZ.

### NORTH-WEST ZONE

First meeting of the year has been held, and if the attendance is an indication of things to come, look for a very promising year. We were pleased to welcome visitor 4XX and Reg 7ZAO, who has been transferred in his job from the southern zone. Also present was Athol 7EB, who unfortunately has little spare time for Amateur "doings", but is always there to lend a hand when needed.

Big news of the N.W. Hamfest to be held at Port Sorell. At the time of writing this promises to be a very good day's outing and much time and effort have gone to this end, particularly on the part of organiser Basil 7BL. Even the tide has been organised to allow cricket to be played on the beach.

Some 2 mhz DX has been worked recently and some DX on 40 and 20. Concern has been expressed at the number of "Commercials" on 80 mhz. How about that I.T.U. Fund donation? Believe Athol 7BW is back on the air after all that flap about t.v.i. Sorry to hear associate Ernest Greenhall is ill in hospital. Wish you a speedy recovery, Ernest. 73, 7ZBH.

## HAMADS

Minimum 5/-, for thirty words.

Extra words, 2d. each.

Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received at E.D. Box 36, East Melbourne, C.S. Vic, by 8th of the month, and remittance should accompany the advertisement. Call signs are not permitted in Hamads. Dealers' advertisements not accepted in this column.

**FOR SALE:** AR88D Rx, £90. Gelooso 222TR Tx, £90. Both in mint cond., had little use. Offer? VK3ANV, Box 239, Bairnsdale, Vic.

**FOR SALE:** Collins equipment of the late VK3JKK. 32S1 Transmitter, £345. 75S1 Receiver, £345, or offer. All offers in writing to W. L. Jackson, VK3XMM, 23 Malane St., Ormond, S.E.9, Vic.

**FOR SALE:** Gear ex late VK3QK: Eddystone 888 Receiver, new condition; BC457A Command Xmitter (7 Mc.); SCR522 Transceiver, with generator supply; Kingsley KS9'er; Type 109 Transceiver; Link Receiver F/M type 1305, tuned Channel 5 (new); CPR55 Range Indicator; Xmitter Tuning Unit TU9B; 109 Power Unit MK. II.; Dynamotor type DA1A; Roof Indicator Unit Y10QB/5000; W/T Set 109 MK. II.; 230-200 volt Transformer; complete home-built a.m. 150w. Transmitter, Gelooso v.f.o., t.v.i. proof, with power supply in rack; Dynamotor Unit P584B; plus miscellaneous valve sockets, etc. All equipment in working order. Best reasonable offers accepted. Contact Arthur Evans (VK3JVQ), phone 99-2817, or Arthur Tinkler (VK3ZV), phone 29-3446 (Vic.).

**FOR SALE:** Complete home-built Gelooso v.f.o., plate and screen modulated Transmitter; and R107 Receiver. Also Type 3 Mk. II. Transceiver complete. In good order, offer? Equipment of ex late VK3CH. C/o N. Harris, 1 Duncan St., Birchpie, Vic.

**FOR SALE:** Hallicrafters SX111 Revr., 80 thru, 10 metres and WWV, a.m. c.w., s.b.b., selectable sideband, large slide-rule dial, 0.5 to 5 Kc. selectivity xtal cal., noise limiter, notch filter, as new condition, £190. VK2DM, 40 Ware St., Fairfield, N.S.W. Phone 72-5601.

**FOR SALE:** Model 840C Eddystone Comm. Receiver, 480 Kc. to 30 Mc. Excellent condition. Price £65. Mrs. J. Anderson, 14 Moore St., Toronto, 2N, N.S.W.

**FOR SALE:** Trans. Cabinet, ducoed grey, 68" high, 22" deep, 26" wide, price 30/- . Smaller Cabinet, ducoed grey, 20/- . Power Supply parts; back issues of "QST", "CQ" and "Short Wave Magazine"; text books. VK3DM, 110 Francis St., Ascot Vale, W.2, Victoria. Phone 37-4071.

**FOR SALE:** Wagner Sideband Transceiver, covers 80, 40, 20, 15 and 10, upper or lower sideband, break-in c.w. with audio tone monitor, 2.1 kc. mechanical filter, two v.f.o.'s with 1 Kc. accuracy, built-in vxo, p.t., xtal cal. "S" meter, 80w. input, in-built relay for linear, only 15" x 10" x 6", complete with a.c. power supply and speaker in matching cabinet. Still under factory warranty, £390. VK2DM, 40 Ware St., Fairfield, N.S.W.

**SELL:** Collins 32S1 Transmitter, with 512F2 power supply, £360. 75S3 Receiver, £330. All in excellent condition. J. G. MacIver, 21 Hurd Tee, Morningside, Brisbane.

**SELL OUT:** Best offer. Commercial Power Supply, 1,000v-1,200v, c.t., 500v c.t., four 866As, Filters, Fil. Trans., 1 chassis, 1 Trx, pair 807's, 5" C.r.o., Super Pro Rx, A.c. Relays, Valves, Condensers, etc. A. O. Brand, 37 Pacific Pde., Long Jetty, N.S.W.

**SELL:** TBY Transceiver, 28 to 80 Mc. complete with original Handbooks, Phones and Mike, ideal mobile or portable, £10. Cyldon 10 Channel Tele-tuner, £9. VK3ZKA, Phone 23-7480.

**SELL:** Woden UM3 mod. trans., £5. Woden UM1 mod. trans., £3. A & R power trans., 1,000v. aside at 500 ma., tappings down to 500v., £5. A & R filter choke, 2 only, £2.50. A & R 222 transceiver, fully equipped, £5. Byer 55 tape recorder, goes but needs a little work, £10. VK3AHT, Phone 314-6760 (Vic.).

**SELL:** 3 element 14 Mc. Beam and 40 ft. Steel Tower, with prop-pitch motor, £75. Heathkit Balun, £6. M. Hilliard, 57 Gardena St., Blackburn, Vic.

**SELL:** 5AX Pre-selector, £3. Collins 3.1 Kc. Mechanical Filter, £10. 50 Mc. Mobile Converter, £10. 10 element 144 Mc. Yagi, £5. M. Hilliard, 57 Gardena St., Blackburn, Vic. Phone 89-2498.

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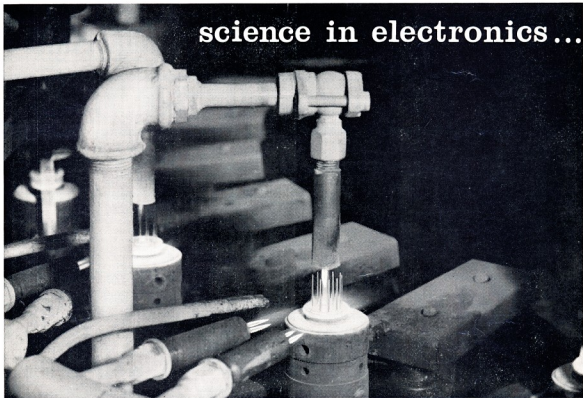
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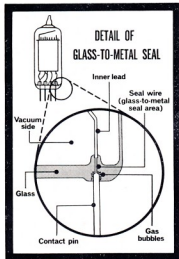
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